

he had employed this technique, the vicious circle was established. One patient died, the other vomited for days, and finally recovered after refusing a second operation. Dr. Stewart's intention in this case, had permission to operate been obtained, was to ligate the pylorus or some point near it. He does not believe that drainage of the gall-bladder would aid recovery in these cases. Scudder's operation differs from Moynihan's in location, being at the beginning of the jejunum, and thus rendering entero-anastomosis impossible.

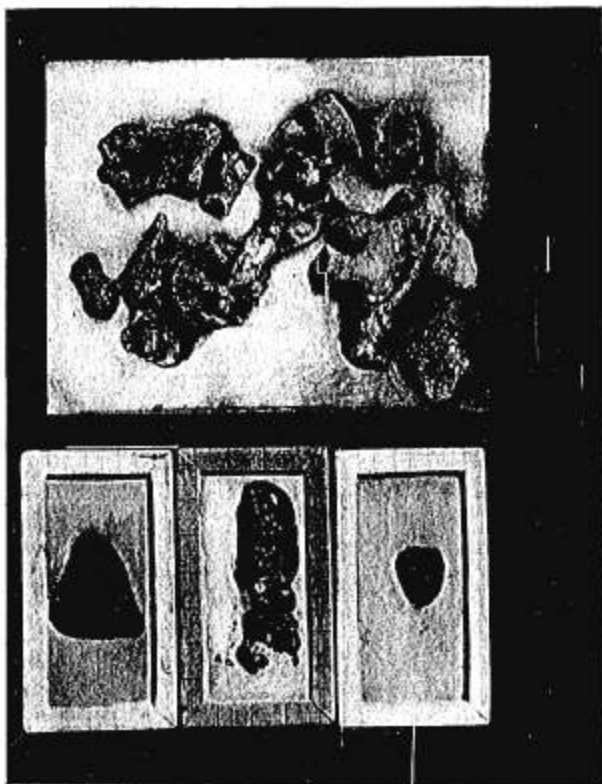
DR. DA COSTA, in closing, said that Dr. Le Conte had raised an important point regarding the utility of draining the gall-bladder in cases of vicious circle. Dr. Le Conte is of the opinion that only a part of the bile passes externally after draining the gall-bladder. This same point had occurred to Dr. Da Costa; but he thought that such a large amount passes externally that the stomach would be considerably protected by the procedure, for it seems to have been demonstrated that after every gastro-enterostomy some bile enters the stomach, and that a small amount of bile apparently produces little or no disturbance. The disturbance occurs only when there is a quantity of bile; and, by taking a large amount externally every day, one would certainly diminish greatly the amount that would be present in the duodenum and which could enter the stomach.

Dr. Da Costa, of course, recognizes the fact that the suggested expedient is a pure experiment, and might completely fail on trial; but he believes that, had the vomiting continued in the case reported, a trial of the operation would have been justifiable. Dr. Le Conte's objection that this would not prevent the intestinal contents from points further down from entering the stomach did not seem weighty to Dr. Da Costa, as he does not believe that in most of these cases any of the intestinal contents from farther down reaches the stomach. If it should do so, it would give evidences of its presence; and these evidences would, of course, contraindicate the operation of draining the gall-bladder.

#### NEPHROLITHOTOMY.

DR. GWILYM G. DAVIS reported four cases in which he had removed renal calculi by incision into the kidney.

CASE I.—Laborer, aged thirty-three years. Six years ago



Figures showing the calculi removed in Dr. Davis's cases of nephrolithotomy.

he had several attacks of what were probably renal colic. His present illness dates back five months. He contracted a heavy cold with cough, fever, and pains all over his body. During this illness he was seized with a sharp pain in the right lumbar region. It was localized and cramp-like in character. He was confined to bed for two days, and then went back to work and remained at it for a month. He then fell sick and indisposed, with sharp pain in the right lumbar region. He also had headache. The pain in the side lasted thirty-six hours, and then suddenly ceased, and there was a sensation as of something passing into the bladder. Since that time he had vomited a great deal, had some difficulty in urinating, and passed bloody urine. The urine stopped suddenly, but sounding failed to find any stone in the bladder. There was a skiagraph taken by Dr. C. H. Leonard, and, while the indications were not at all marked, he still expressed the opinion that a stone was present. Urine was sometimes acid, sometimes alkaline, and at others neutral. Sometimes it contained pus and blood. Specific gravity, 1018 to 1022; few bacteria.

*Operation.*—An incision about four inches long was made on the right side obliquely downward from the twelfth rib. The kidney was drawn out and the stone located by a needle. An incision about an inch long was made on the convex surface of the kidney, through which a triangular-shaped stone was extracted. (Fig. 1.) This incision was closed with four catgut sutures passed directly through the kidney with a round needle and tied with sufficient firmness to close the wound and stop the bleeding. The external wound was closed at each end and packed in the middle. In attempting the removal of the gauze, free hæmorrhage occurred. The packing was allowed to remain for several days longer, and was eventually removed, and subsequent convalescence was rapid and uneventful.

The first examination of his urine showed it to be red in color from blood. Specific gravity, 1018; alkaline in reaction; no crystals, but plenty of bacteria.

Ten days later it had a specific gravity of 1020, was pale straw color, faintly alkaline, and contained some pus-cells and bacteria as well as some alkaline phosphates. A still later examination gave a neutral reaction, no albumen, pus, or blood, and but few bacteria. There were some urates and uric acid crystals.

The calculus was heart-shaped, twenty-five millimetres (one inch) wide by thirty millimetres long, and about ten millimetres thick. An examination by Professor John Marshall showed that it was composed of calcium oxalate (mulberry calculus), and that it weighed 7.3 grammes (110 grains).

CASE II.—Young man, aged twenty-one years. He stated that a doctor had removed a stone from his bladder when he was four years old. Present illness began three and a half years ago with sharp, lancinating pain in the right lumbar region, extending as far forward as the mid-axillary line. For a year after this attack he felt well, when he had another, and then two more, two months apart, in which last one he had continuous pain for two months, when it ceased, and was absent for four months. The first of these attacks confined him to bed, and the pain was relieved by lying on the right (affected) side, while it was increased by lying on the left side. He has never had sick stomach, nor has the pain ever radiated down the ureter or testicle. On admission to the hospital he was a moderately well-nourished young man, sallow complexioned, with acne of the face. Pulse good, tongue normal; he complained of pain in the right side of the lower half of the chest and in the right lumbar region. There was tenderness on pressure, but no fulness. A skiagraph, taken by Mr. Riedel, showed a faint shadow about two inches from the median line and just below the costal margin. During the week previous to operation he had a slight chill, with temperature  $100^{\circ}$  to  $101^{\circ}$  F. Headache, coryza, slight conjunctivitis, and cough. These symptoms disappeared previous to operation. The urine was cloudy, yellow, with a dense white sediment; faintly acid in reaction; a few blood-corpuscles, and a marked trace of albumen. No casts, but an abundance of pus. Later it still continued turbid, contained pus, and its reaction became alkaline; it contained crystals of the triple phosphates.

*Operation.*—Under ether anaesthesia, a four-and-one-half inch incision was made down and out from the twelfth rib. The kidney was found much enlarged, capsule inflamed, thickened, and densely adherent. Kidney delivered with difficulty. A thin sac from three to ten millimetres (one-eighth to three-eighths inch) thick was all that remained of the kidney substance. This covered a large mass of stones, which were removed through an incision on the convex border. (Fig. 2.) The wound was packed

and drained. Recovery from the operation was prompt, there being but little shock. In the course of the week following the operation he had an attack of congestion of the lungs, which cleared up and the gauze packing was removed without difficulty. He passed from fifty-one to sixty ounces of urine per day, and the urea ranged from 1.9 per cent. to 2 per cent. The wound healed rapidly and was soon entirely closed, and, though the urine remained turbid, he seemed in excellent health, and later left the city. The calculus was composed of triple ammonium, magnesium phosphates, and weighed 953 grains, nearly two ounces or sixty-two grammes.

CASE III.—This was a young married woman aged twenty years. Present illness. For the past four months complained of attacks of pain coming on at irregular intervals, but bearing no relation to the menstrual periods. The pain was described as dull and "pressing;" at times it was sharp, commencing in the right lumbar region and radiating to the iliac and umbilical regions and down the right leg as far as the knee. No history of other attacks of renal colic. The pain was somewhat relieved by bending forward; vomiting occurs at times during these attacks. She had chilly sensations, but only one chill previous to operation. Was unable to bear the constriction of the clothing around the waist. She had had trouble with her urine for months. It dribbles away, and its passage was accompanied by straining. There was increased frequency of urination but no burning. It has been milky in color and ropy in consistency. No history of the passage of gravel or calculi. Urine, specific gravity, 1028; moderately acid; heavy trace of albumen. No casts; light amber in color, cloudy, and contained an abundance of pus.

On admission she was of a rather spare build, face flushed, tongue coated, abdomen not distended, no tumor discoverable. There was tenderness, not marked, in the region of the right kidney and right iliac fossa. A skiagraph showed a fairly distinct shadow indicating a probable stone in the right kidney. The urine previous to operation was acid in reaction. Specific gravity, 1013 to 1018; turbid; marked trace of albumen; dense sediment of pus. No casts; a few blood-corpuscles, and no tubercle bacilli. A later examination showed some hyaline and granular casts and bacteria in short and long chains. Some oxalate crystals

were found at times. The urea varied from 1.6 per cent. to 2.3 per cent.

*Operation.*—An oblique incision was made downward and forward from the twelfth rib and a stone ten by fifteen millimetres removed through an incision in the cortex. It weighed about two grammes, and was composed of oxalate of calcium, mulberry calculus. (Fig. 3.) The wound was packed, and on attempting its removal two days later the bleeding was so free that it was reinserted and left five days longer, when it was removed without further bleeding. The wound promptly healed and she was discharged cured.

CASE IV.—Married woman aged forty-four years. Present illness began two years previously with a sharp pain in the right side, at first this was intermittent, but later became constant. It radiated downward into the right groin. A skiagraph was made by Dr. Leonard, and he gave it as his opinion that a stone was present. Another skiagraph in another hospital failed to show the stone. An operation was done seven months ago and a large amount of pus evacuated from around the kidney and under the liver. Since this operation a sinus persisted in the loin, which led up under the liver and discharged large quantities of pus. The pains in the side still persisted of the same character and intensity. The urine was yellow, cloudy; specific gravity, 1022; acid; trace of albumen and an abundant white sediment. There were no casts. No crystals, but abundant leucocytes, no red blood-corpuscles.

*Operation.*—The sinus leading under the liver was slit up by following along the edge of the ribs and a very large amount of pus evacuated. The incision was then prolonged backward and the kidney exposed, and a stone of considerable size extracted. It consisted of calcium carbonate and triple ammonium, magnesium phosphates. It weighed 5.66 grammes (88 grains). (Fig. 4.) The wound was packed, and again there was troublesome bleeding before the packing was finally removed. Healing was rapid and the sinus closed in a little over a month's time.

Dr. Davis said that the question of diagnosis in cases of renal calculi is not always readily settled. In two of these four cases the presence of a calculus had not been previously recognized. Personally, his belief is that exploratory incision is justified when marked local symptoms point to kidney involvement. Probably

the best means of diagnosis is the X-rays, but even they are not absolutely conclusive. The value of an opinion depends largely on the personal skill of the examiner. In Case I the X-ray indications were not at all marked, yet Dr. Leonard expressed the opinion that a stone was present, and such proved to be the case. The stone was a good-sized one of oxalate of calcium, and should have given a good shadow. Case II likewise gave a faint showing, but Mr. Riedel claimed that it showed the presence of stone, and he was right; but the amount of calculus present was enormous, and should have given undoubted evidence. The fact that it was phosphatic in character may have been the cause of its not showing a stronger shadow. Case III had the smallest stone, oxalate of calcium, and threw a distinct, clear shadow, satisfactory in every way. It also was taken by Mr. Riedel. In Case IV Dr. Leonard had pronounced a calculus present, and another operator had failed to demonstrate it. The former proved to be correct. There can be little doubt but that in the hands of a skilled operator the X-rays will almost certainly show the presence of a stone if one is really there. Negative evidence is only to be accepted after repeated failures, and the positive evidence is to be interpreted by one accustomed to examine skiagraphs for the presence of calculi. The fact of all these cases involving the right kidney was worthy of note. It seems to show that the right kidney is more liable to calculous disease than the left, as well as more liable to dislocation. Recently a case came under his care in which the symptoms pointed to the presence of a renal calculus in which two skiagraphs were negative. Operation revealed an abscess of the kidney with no stone present, although small calculi had some time previously been passed from the bladder.

The urine in renal calculus is more often acid than alkaline. It may vary from time to time. In two of these cases it was alkaline at some period of the disease, but was most often acid. For part of the time it was acid in Case II, in which the whole kidney was blocked up with large masses of triple phosphates.

The presence of blood in the urine seems to be a reliable symptom. It was present in all the cases at some stage. In the first case there was a history of large amounts of blood coming away with the urine, but in the other three it was small in amount and only occasionally seen. Often it is only to be detected by

microscopic examination. Pain in the region of the affected kidney also showed itself quite a reliable symptom.

As regards the operative procedures, the incision used was an oblique one, extending from the anterior end of the twelfth rib downward and forward towards the anterior portion of the crest of the ilium.

This is preferred to the straight incision of Edebohls along the edge of the erector spinæ muscle because it can be extended both upward and downward if desired. Particular care is necessary in making the upper portion of the incision. The pleura crosses the twelfth rib about at its middle, or a little farther posterior; and if the incision is made up to the rib posterior to that point the pleura is liable to be wounded. The twelfth rib should be carefully identified, as, if it is short, it may be overlooked and the eleventh rib mistaken for it. Additional space can be gained if necessary by prolonging the lower end of the incision along the crest of the ilium. The question of bleeding may prove a serious one. That of the soft parts is readily controlled, and if the kidney is delivered externally the bleeding from it likewise can be checked. There is a temptation in these cases, when a stone is felt beneath the examining finger, to simply incise and lift it out with the forceps. In doing this the bleeding is apt to be exceedingly free and persistent, and only controlled with the greatest difficulty. For this reason no attempt should be made to either search for or extract a stone unless the kidney has been rendered accessible by drawing it out of the wound, or placing strips of gauze beneath each end. When it is once outside, an incision can be made in the convex edge just posterior to the median line and a digital examination made of its interior. After the extraction of the stone the wound is closed by three or four catgut sutures passed directly through the organ a half an inch or more posterior to the edges of the incision, with a round needle, and tied over the wound. This checks all hæmorrhage. While bleeding can be checked by packing forced into and on the kidney while it is lying in its bed, the procedure is dangerous and unreliable. Much blood will almost certainly be lost, and the patient is liable to be lost also. If packing has been resorted to its removal is likely to be followed by a renewal of the hæmorrhage, and it may be profuse. For this reason it is well to wait for several days and then inject peroxide of hydrogen to loosen



the gauze, and if it does not come away readily to allow it to remain until it becomes loosened of itself. It is well to put a rubber tube around each end of the kidney, securing them outside the wound, so that the kidney can be lifted up if necessary to control bleeding. These tubes can be taken away after the gauze has been removed and all danger of hæmorrhage passed. Healing in his cases had been prompt, and, though urine began to discharge externally almost at once, it ceased in a few weeks as the wound closed. It will take longer for the urine to clear, and it may remain turbid for a long while after the wound has healed and all calculous symptoms have disappeared.

DR. ROBERT G. LE CONTE said that in his first operative cases of renal calculus he was very greatly concerned about the hæmorrhage, which appears very alarming. As a rule, however, the hæmorrhage will lessen in a few minutes, or can readily be controlled by gauze packing. He did not fear to incise a kidney which could not be delivered through the wound, as he had seen two cases where delivery of the organ was impossible, and after incision the hæmorrhage was readily controlled by packing. If packing has been used to control hæmorrhage it should not be removed for a number of days, and then only after every precaution has been used to loosen it, namely, salt solution, peroxide, etc.

In answer to a question by the President, Dr. Le Conte said he had seen a renal calculus in a child under one year, the stone having been found at the post-mortem examination.

DR. HENRY R. WHARTON, speaking of the age of subjects of renal calculus, said he had seen one in a child of nine years. The patient had an abscess of the pelvis, and after operation the calculus was discharged from the abscess cavity.

DR. DAVIS, in closing, said the line of incision in opening the kidney should be at the point of anastomosis, of the anterior and posterior vessels, which is slightly posterior to the middle line. Regarding hæmorrhage, he felt a stone in the kidney in one case and thought it could readily be lifted out; he at once incised the organ and introduced forceps, which brought away only part of the stone, several trials being necessary to clean out the fragments. Hæmorrhage was severe, and he believes it would have been better to first secure control of the kidney before making attempts at extraction.